

AMENDMENTS TO THE CLAIMS

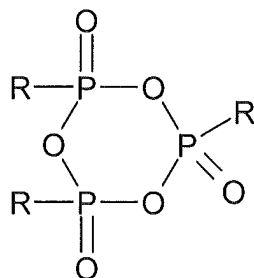
Claims 1-21 (Cancelled)

22. (Currently Amended) A proton-conducting polymer membrane based on polyazoles which can be obtained by a process comprising the ~~steps of~~ steps of:

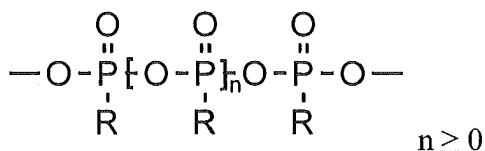
- A) dissolving the polyazol-polymer in organic phosphonic anhydrides with formation of a solution and/or dispersion,
- B) heating the solution obtainable in accordance with step A) under inert gas to temperatures of up to 400⁰C,
- C) forming a membrane using the solution of the polyazole polymer in accordance with step B) on a support and
- D) ~~treatment of~~ treating the membrane formed in step C) until it is self supporting.

23. (Previously Presented) The membrane according to claim 22, wherein in step B) said heating is up to 300⁰C.

24. (Currently Amended) The membrane according to claim 22, wherein in step A), said phosphonic anhydrides are (1) of the formula

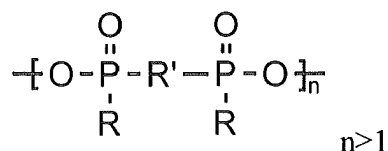


(2) ~~linear or linear~~ compounds of the formula



or

(3) anhydrides of the multiple organic phosphonic acids of the formula



wherein the radicals R and R' are identical or different and represent a C₁-C₂₀ carbon-containing group.

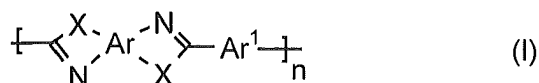
25. (Currently Amended) The membrane according to claim 22, which further comprises in step A), a polyphosphoric acid having a content of at least 83%, calculated as P₂O₅ ~~(by acidimetry by~~ acidimetry.

26. (Previously Presented) The membrane according to claim 22, which further comprises in step A), P₂O₅.

27. (Previously Presented) The membrane according to claim 22, wherein in step A), B) or step C), a solution or a dispersion/suspension is produced.

28. (Previously Presented) The membrane according to claim 22, wherein the polymer used in step A) contains recurring azole units of the general formula (I) and/or (II)

wherein



Ar are identical or different and represent a tetravalent aromatic or heteroaromatic group which can be mononuclear or polynuclear,

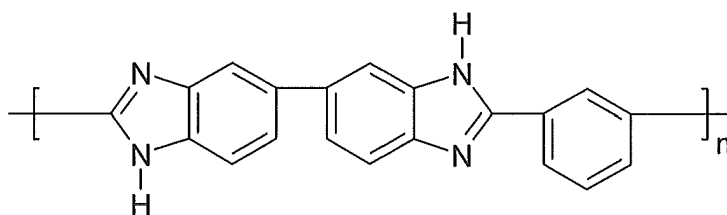
Ar¹ are identical or different and represent a bivalent aromatic or heteroaromatic group which can be mononuclear or polynuclear,

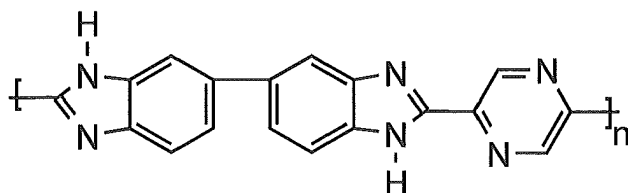
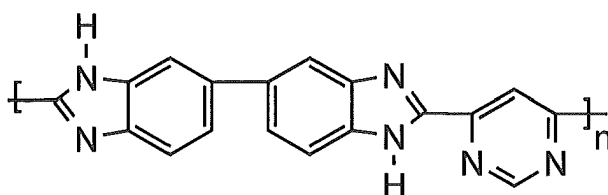
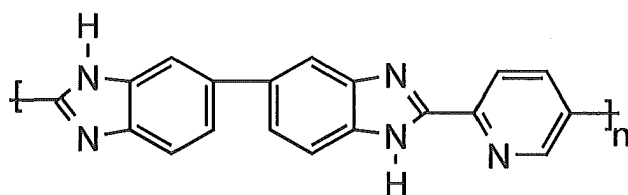
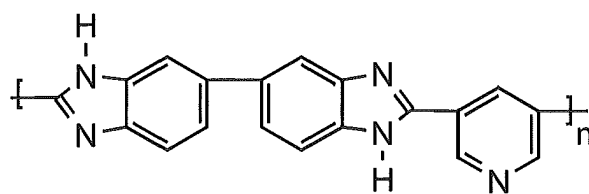
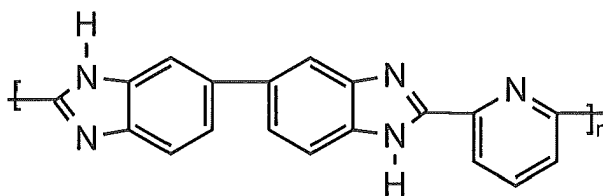
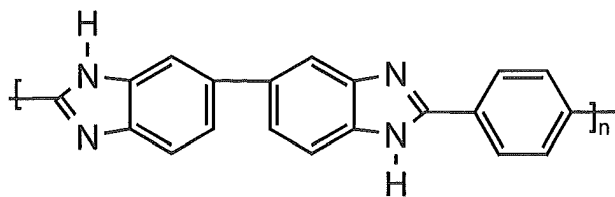
Ar² are identical or different and represent a bivalent or trivalent aromatic or heteroaromatic group which can be mononuclear or polynuclear,

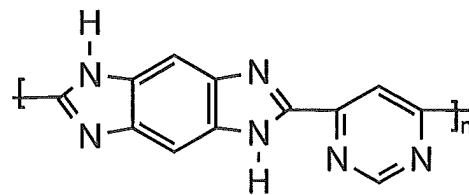
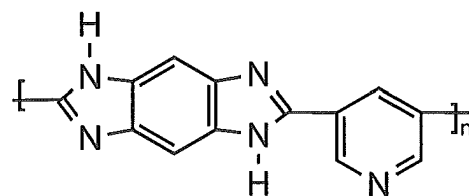
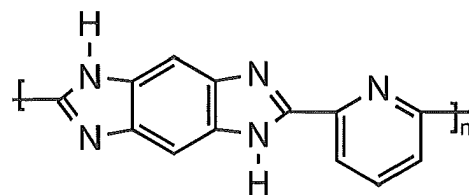
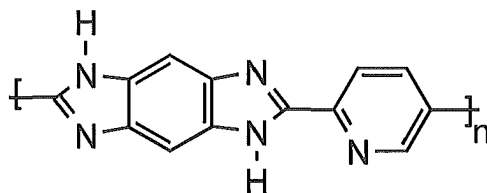
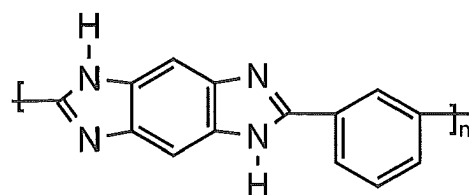
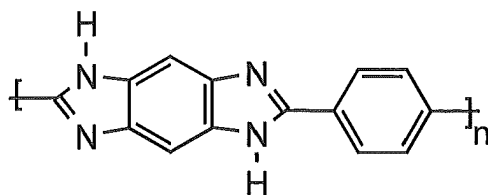
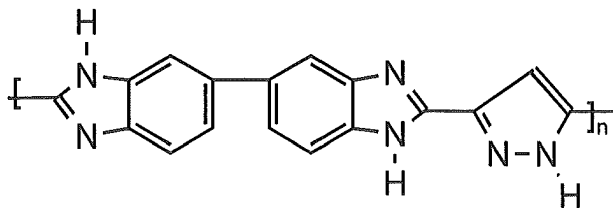
X are identical or different and represent oxygen, sulphur or an amino group which carries a hydrogen atom, a group having 1 - 20 carbon atoms, preferably a branched or unbranched alkyl or alkoxy group, or an aryl group as a further radical.

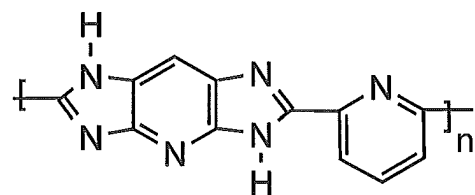
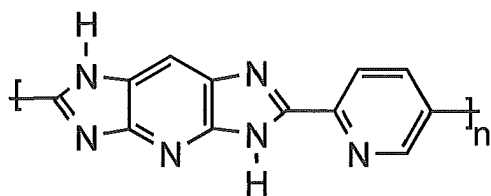
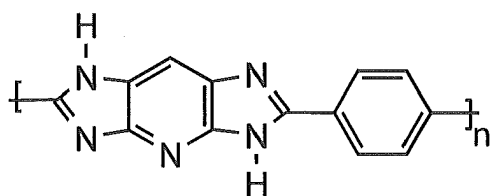
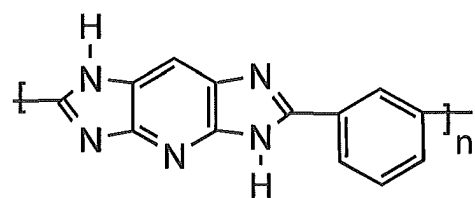
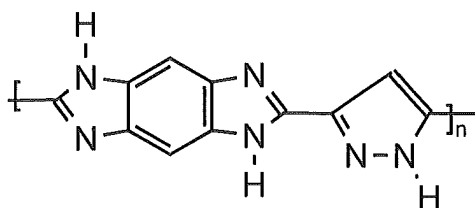
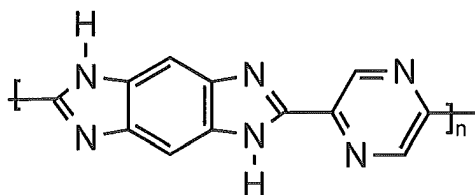
29. (Previously Presented) The membrane according to claim 22, wherein, in step A), the polymer selected from the group consisting of polybenzimidazole, poly(pyridines), poly(pyrimidines), polyimidazoles, polybenzothiazoles, polybenzoxazoles, polyoxadiazoles, polyquinoxalines, polythiadiazoles and poly(tetrazapyrenes) is used.

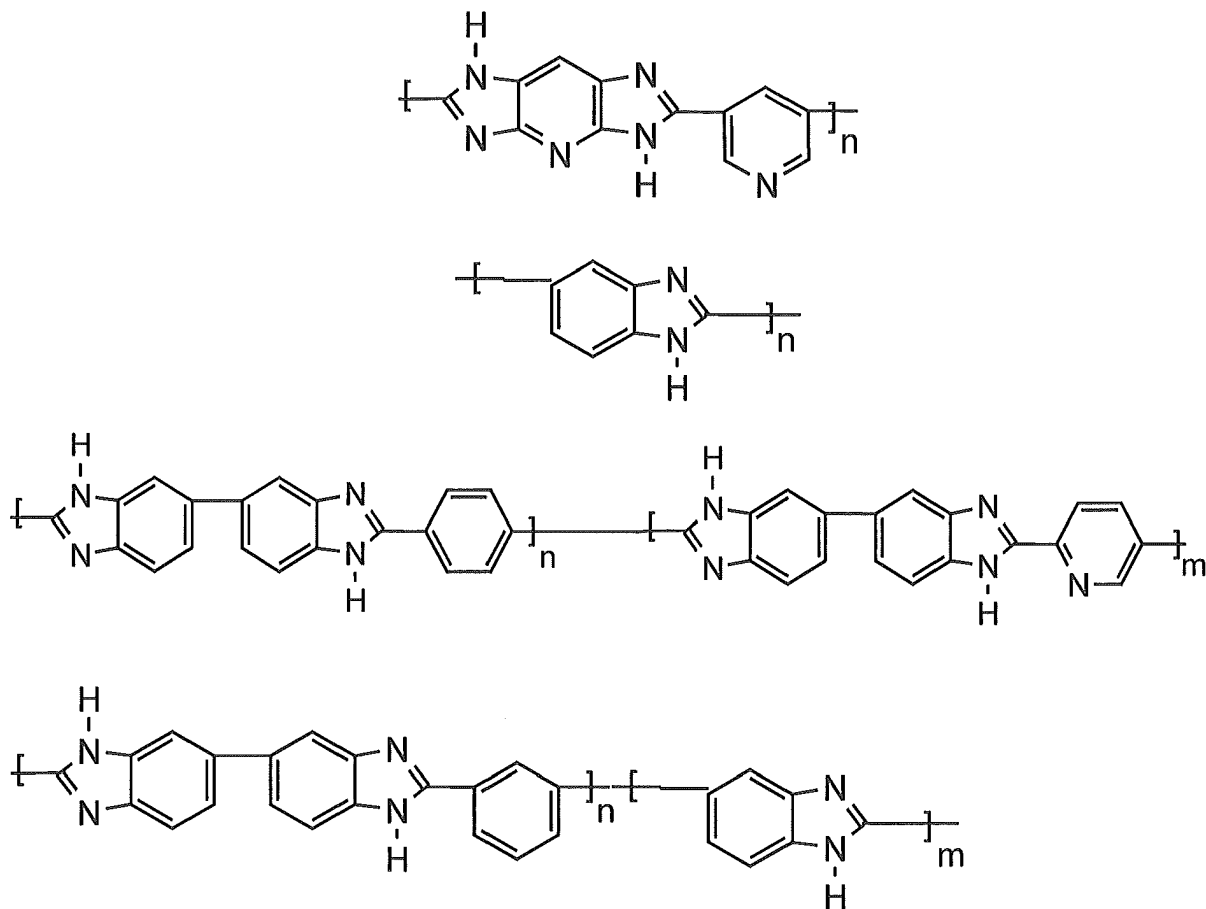
30. (Previously Presented) The membrane according to claim 22, wherein in step A), the polymer used contains one or more recurring benzimidazole units of the formula











where n is an integer greater than or equal to 10.

31. (Currently Amended) The membrane according to claim 22, wherein, before, during or after step A) ~~and/or~~ and/or step B) or before step C), a further polymer is added as blend material.

32. (Previously Presented) The membrane according to claim 22, wherein, before step D), the viscosity is adjusted by addition of phosphoric acid and/or organophosphonic acids.

33. (Previously Presented) The membrane according to claim 22, wherein the membrane produced in accordance with step C) is treated in the presence of moisture at temperatures and for a period of time until the membrane is self-supporting and can be detached from the support

without any damage.

34. (Currently Amended) The membrane according to claim 22, wherein the ~~treatment~~ treating of the membrane in step D) is performed at temperatures of more than 0⁰C and less than 150⁰C, in the presence of moisture or water and/or steam.

35. (Currently Amended) The membrane according to claim 22, wherein the ~~treatment~~ treating of the membrane in step D) is performed at temperatures of more than 20⁰C and less than 90⁰C, in the presence of moisture or water and/or steam.

36. (Currently Amended) The membrane according to claim 22, wherein the ~~treatment~~ treating of the membrane in step D) is for 10 seconds to 300 hours.

37. (Previously Presented) The membrane according to claim 22, wherein, in step C), an electrode is chosen as the support and the treatment in accordance with step C) is such that the membrane formed is no longer self-supporting.

38. (Previously Presented) The membrane according to claim 22, wherein, in step C), a layer having a thickness of 20 to 4,000 pm, is produced.

39. (Previously Presented) The membrane according to claim 22, wherein the membrane formed in step D) has a thickness between 15 and 3,000 μm .

40. (Previously Presented) An electrode having a proton-conducting polymer coating based on polyazoles which can be obtained by a process comprising the steps of

A) dissolving the polyazol-polymer in organic phosphonic anhydrides with formation of a solution and/or dispersion,

B) heating the solution obtainable in accordance with step A) under inert gas to temperatures of up to 400⁰C,

C) forming a membrane using the solution of the polyazole polymer in accordance with step B)

on an electrode and

D) treatment of the layer formed in step C).

41. (Previously Presented) The electrode according to claim 40, where the coating has a thickness between 2 and 3,000 μm .

42. (Previously Presented) A membrane electrode unit containing at least one electrode and at least one membrane according to claim 39.

43. (Previously Presented) The membrane electrode unit containing at least one electrode according to claim 40.

44. (Previously Presented) A fuel cell containing one or more membrane electrode units according to claim claim 43.